Province of Nova Scotia

Electricity Marketplace Governance Committee

Second Interim Report

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EXECUTIVE SUMMARY

This is the second of two interim reports produced by the Nova Scotia Electricity Marketplace Governance Committee. Both are the product of deliberative process, begun in June 2002 as a direct outcome of the release of the Nova Scotia *Energy Strategy* in late 2001. To date those discussions have touched on the role of forces external to the Province in helping to shape local actions, definition of recommendations to help guide the creation of Transmission Tariff, and many discussions devoted to the interconnected topics of Market Scope (i.e., the degree to which the market is open to competition) and Market Model (i.e., how the electricity sector will carry out basic operational activities). All three items were the subject of the First Interim report which was released in January of this year. The latter subject was left temporarily unresolved but discussions continued.

This second report continues the discussion of markets and offers five recommendations to elaborate the Committee view that the market should be opened initially to permit competitive choices only by wholesale customers, representing less than 2% of the total market. The role of cogeneration in market scoping remains, for the moment, an unresolved issue. It is presently under discussion and will be dealt with in the Final Report of the EMGC. The Committee further concluded that the most appropriate market model would be a Bilateral Market Model.

Much of the remainder of the report deals with the broad subject of enhancing electricity generation from renewable energy sources, which is a direct outgrowth of the expectations that were outlined in *Energy Strategy*. Twenty four recommendations distill Committee deliberations regarding the steps that will be required in order to create an environment conducive to this goal. Specifically, they provide some guidance regarding the infrastructure that will be required to define, certify and monitor electricity produced from renewable sources. They address the merits of a contractual purchase agreement, referred to as a Renewable Portfolio Standard, and offer guidance as to future implementation. Programs designed to address the marketing needs of green energy are advanced along with definition of rules (Net Metering) to guide the flow of electricity from independent producers into the larger grid. In addition, the definition and rules related to Net Metering are provided. These recommendations balance the needs of distribution utilities and the desires of individuals who wish to self-generate a portion of their electricity requirements from renewable energy sources.

The final two recommendations concern the subject of energy efficiency, specifically encouraging government information programs to assist the public interested in reducing electricity consumption and discouraging any "tax" on ratepayers to support such programs.

1.0 INTRODUCTION

Directed by Nova Scotia's *Energy Strategy*, the most recent deliberations of the Electricity Marketplace Governance Committee (EMGC) have been focussed on resolving the issues of market scope, market model and the promotion of electricity derived from renewable resources. The first two items were previously considered in an earlier report but without resolution. Many lengthy discussions were devoted to each since they occupy central roles in any discussion of possible restructuring of Nova Scotia's electricity industry. The latter issue is seen to offer the dual advantages of providing greater diversity in the energy resource mix while moving forward with more environmentally friendly options for the future.

The underlying dilemma that many jurisdictions undoubtedly face is the degree to which change should be embraced in what appears to be an irresistible dynamic of change within the electricity industry worldwide. In a sense this dilemma is constructed around the desire to create benefits for the community while avoiding any as yet unseen or unpredictable costs. Undoubtedly, the Committee's view is that the safest approach is to act very conservatively, while it is can also be perceived as the course of action least able to create change.

The *Energy Strategy*, as the first incremental step toward change, directed a minimum market opening to include all wholesale customers, without precluding additional initiatives that might embrace a larger segment of the market. As part of this dynamic, it also directed the promotion of new opportunities and players in the area of green energy generated from renewable resources, the product of which could then be sold directly to retail customers. Committee deliberations have repeatedly centered on the need to chart a course for Nova Scotia which is simultaneously capable of creating change while avoiding the excesses of other jurisdictions.

The EMGC believes that this Second Interim Report has achieved this balance. However, as an interim document it has been prepared as a form of window on the Committee's deliberations, and as such comments about its contents would be gratefully received. It is anticipated that the Final Report of this group will be released at the end of May 2003.

2.0 MARKET SCOPE AND MARKET MODEL

The scope of a market is defined by how much of it is open to competition. In a fully competitive retail market, all end use electricity customers are free to choose to buy electricity from any supplier.[1] Other levels of competitive opening are possible, and in many markets the choice has been to open the market in phases. Under such a structure, choice may be made available first to the largest customers, then to gradually smaller customers until all are able to choose competitive supply. Therefore, a discussion of market scope in this document is a discussion of what customers the EMGC should recommend as eligible to choose competitive supply of their electricity energy.

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[1] That part of the supply that consumers can choose is the commodity portion of electrical energy. The delivery functions - transmission and distribution - remain regulated monopolies.

A market model defines how an electricity system will carry out the basic activities of determining how much electricity is generated, at what price, and with what resources. Market models discussed in the EMGC's First Interim Report include a fully competitive pool, a single buyer model, and a bilateral contract market. Some market models are compatible with a wide range in market scope so linkages do not necessarily exist between these two choices. However, in general, the wider the market scope, the more competitive the market model, so the discussion of a future market model naturally followed that of market scope.

2.1 Market Scope in the *Energy Strategy*

A key objective in the electricity section of Nova Scotia's *Energy Strategy* is "To phase in competition in the Nova Scotia electrical industry"[2] As an initial step, competitive suppliers would gain access to the wholesale market and both cogenerators and independent generators would be allowed non-discriminatory access to the transmission system in order to supply eligible customers and export markets. The *Energy Strategy also* noted that it is important for export sales to customers in the United States to create an open-access transmission system.[3]

Opening the wholesale market to competition will expose only a very small portion of the total market to competitive supply. Wholesale customers comprise six municipal utilities, which collectively account for about 1.6% (less than 50 megawatts) of peak demand in Nova Scotia. As the *Energy Strategy* observed, this constraint limits possible market losses by Nova Scotia Power (NSPI) to only a small fraction of its total market.

The *Energy Strategy* also committed to using expanded consumer choice as a way to promote certain more desirable forms of generation. One commitment was specifically directed to independent power producers (IPPs) who sell electricity produced from renewable energy sources. They are granted direct access to retail customers. In addition, the *Energy Strategy* stated that cogenerators and independent generators would be allowed non-discriminatory access to the transmission system in order to supply eligible customers, and to access export markets. The EMGC has not yet reviewed additional means of promoting cogeneration but one possibility might be to allow cogenerators greater retail access.

In Nova Scotia, exposure to electricity market forces is expected to increase regardless of further expansion of the market to retail customers. The *Energy Strategy* states that when the system requires new supply, it will be obtained through a competitive process. The UARB will initiate and oversee a Request for Proposals (RFP) process, followed by competitive selection of an investment project(s). The cost of the successful project will depend on market conditions at the time of the RFP.

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[2] *Energy Strategy*, Volume 2, Part III, Electricity, Pg. 4.

[3] Ibid, Pg. 18

2.2 Market Scope in Other Jurisdictions

Many jurisdictions that have restructured their electricity industries have chosen a gradual approach to broadening the scope of their market. Typically, they first allow only the largest customers to choose competitive supply. Over time, the scope of the market can be expanded until all customers, even the smallest retail customers, can choose among competitive suppliers.

This gradual approach allows the market design and market model to be tested and improved before exposing all customers to the vagaries of competition. In general, the more competitive the market, the greater the price volatility. Keeping the market small initially can reduce the impact of price volatility on residential and other small customers. Also, a narrower market scope is likely to incur lower transition and ongoing administrative costs than a broader one. The flip side, of course, is that the more competitive the market opening is, it will exert pressure on producers to increase efficiency and keep costs down.

Other jurisdictions in Canada have chosen different approaches. In Ontario, the entire market was initially opened at a single stroke, though subsequent policy changes have temporarily limited retail competition. However, in Alberta the initial opening embraced only large customers, including the large municipal utilities. Quebec, on the other hand, has opened its market only to a relatively small group of municipal utilities.

New Brunswick, as the final example, is currently taking steps to open municipal utilities and large industrial customers to competitive supply, amounting to approximately 30% of the total market. As a result of these changes, it has chosen to create an Independent System Operator (ISO) to facilitate the bilateral contract market, an Open Access TransmissionTariff (OATT) and an Open Access Same-Time Information System (OASIS) system. This transition in market design will incur significant costs, which must also include those associated with the corporate unbundling of New Brunswick Power.

2.3 Implications of Market Scope for Nova Scotia

The *Energy Strategy* clearly took a cautious approach to market scope. In the First Interim Report the EMGC noted the following:

> the EMGC believes that true competition in electricity supply in Nova Scotia will require the entry of competitive generators. Demand from the municipal utilities alone, which together have a peak load of under 50 MW, is simply not large enough to prompt competitive entry....[L]imiting competitive choice to the municipal utilities severely limits the potential for competition in the market[4]

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[4] Nova Scotia Electricity Marketplace Governance Committee, "First Interim Report", Pg. 25.

During the discussion, the EMGC, drawing on information from other jurisdictions, acknowledged that a broader market opening would bring with it higher transition and operating costs. In other words, a tradeoff exists between the costs and risks associated with a wider market opening and the advantages that might accrue from competitive entry into the Nova Scotia electricity market.

2.4 EMGC Discussions on Market Scope

To understand better the potential tradeoffs described above, the EMGC reviewed several different competitive permutations in the Nova Scotia electricity market. The model that was considered most carefully would allow large industrial customers freedom to choose alternate sources of supply. Information provided by NSPI showed that 14 of the largest industrial customers in the province, all of which are directly connected to the transmission system, represent approximately 24% of total electricity demand. Combined with the municipal utilities those eligible to purchase competitive electricity supply would account for almost 26% of the total market.

Several concerns were expressed by EMGC members regarding the potential impact of broadening the market scope in this manner. These include: some assessment of the potential complexity associated with the restructuring process; some estimates of additional costs that might be incurred; and, some measure of price volatility for those participating in the market. The Committee also wanted more information regarding gains that might reasonably accrue from greater competition; and, how those gains might be distributed among potential beneficiaries.

One potential benefit of increased competition is the expectation of a significant reduction in costs. However, without regulator oversight competitive markets cannot ensure that cost reductions will be passed on to consumers in the form of lower prices. Any electricity producer possessing market power can maintain higher prices, despite lower costs, thereby increasing profits.

The EMGC is also aware that there is no direct relationship between market design characteristics and the size of the competitive opening. A modest opening might be accomplished with a highly competitive market structure, while a more ambitious opening does not necessarily have to embrace all of the structural elements of a larger market. However, the Committee generally did associate a broader market opening with a more highly competitive market design. For example, the Committee recognized that while it is not necessary to identify an independent system operator for either market level, the broader market opening would argue more strongly for such an identification.

As part of these deliberations estimates were obtained for both initial and ongoing costs of the various alternatives. The Committee's First Interim Report advanced estimates for the creation and operation of an OATT that would be fully compatible with the requirements of the Federal Energy Regulatory Commission (FERC) in the United States. However, those estimates did not include costs for the development and operation of additional structures that might be needed for a more competitive market. The Committee believes that even though the costs of a full OATT are expected to be modest they should be fairly shared by those transmission users who benefit. Actual costs will fall under the purview of the UARB.

2.5 EMGC Recommendations on Market Scope

To aid the decision-making process, the EMGC considered two competing models: the first limited the market to the municipal utilities, while the second extended the market to include the 14 large industrial customers. Within the scope of these two models, Committee attention then focused on the extent of market change that would be required in each in order to implement these levels of competition. Three alternatives emerged:

- Competition would be limited to the municipal utilities and a transmission tariff would be developed but it would fall short of a full OATT;
- Competition would be limited to the municipal utilities and a FERC-compatible OATT would be developed;
- Competition would be extended beyond wholesale customers to include large industrial customers, a FERC-compatible OATT would be developed and additional structures (e.g., system operator) would also be created or restructured as necessary.

The Committee expressed a clear preference for the first option. Following that preference it was able to formulate and adopt recommendations on market scope. Thus, the first recommendation limits the initial market opening to the municipal utilities, as indicated in the *Energy Strategy* and for the sake of clarity included a reference to the decision regarding retail access for sellers of green power.

Recommendation 2-1. The EMGC recommends that Nova Scotia's initial market opening, to encourage electricity competition, be restricted to wholesale customers, who will then be eligible to purchase electricity from any competitive supplier; and that any seller, offering electricity generated from renewable resources located in Nova Scotia, be able to sell directly to consumers.

In the discussion leading to this recommendation, the Committee recognized that such a limited market opening is unlikely to attract competitive generators to Nova Scotia, and is therefore unlikely to have a significant impact on electricity generation costs. The EMGC recognized, however, the potential for a broader market opening to bring greater risks, including more price volatility.

One possibility considered on market scope was for the EMGC to recommend a future date for a wider market opening. However, the Committee eventually concluded that additional carefully compiled information on the costs and benefits of such an opening would be required before a reasonably informed decision to recommend it would be possible.

Recommendation 2-2. The EMGC recommends that the Government of Nova Scotia begin a detailed quantitative analysis of the costs and benefits associated with broader electricity competition in the Province. Such an analysis is necessary for any further stakeholder and/or government consideration to broadening electricity competition

The EMGC expects that this analysis can not be completed until after it has submitted its Final Report, so it does not expect to make any recommendations based on that additional work.

However, the EMGC is clear in its view that such an analysis should be the basis for any further deliberations on the subject of additional market openings.

Recommendation 2-3. The EMGC recommends that the Government of Nova Scotia resume deliberations, regarding the possibility of broader electricity competition, when the cost and benefit analysis has been completed.

The EMGC wishes to record its opinion, reached after a review of the relative sizes of various customers, that future deliberations dealing with further market opening should consider allowing large industrial customers, directly connected to the transmission system, to choose from competitive electricity suppliers.

2.6 Market Model

The decision, regarding the appropriate electricity market model for Nova Scotia, was contingent on the outcome of the Committee's deliberations on market scope. In other words, the model that would be recommended would need to be compatible with the extent of the market opening.

Earlier, the EMGC reviewed market models employed in other jurisdictions. Among these are bilateral contract and single buyer market models. In a bilateral contract market, participants trade with each other and schedule the resulting transactions with a system operator. In a single buyer market, an integrated utility is the single buyer of all competitive electricity supply which it then offers to all retail customers.

Nova Scotia's present market possesses most of the attributes of the single buyer model. According to the *Energy Strategy*, competition for new supply will occur through a bidding process, which upon completion most of the new supply will be sold to NSPI to meet its obligation to serve the community. However, a pure single buyer model does not allow for any contracting between market participants. In Nova Scotia, some participants will be able to offer and accept competitive supply. To do that requires a market mechanism. The bilateral contract market model is often applied in markets with competition, but without a competitive pool. In the United States, for example, most markets under FERC orders 888 and 889 were bilateral contract markets. Given the level of competitive opening of the Nova Scotia market, the EMGC felt that the bilateral contract market was the most appropriate model.

Recommendation 2-4. The EMGC recommends that eligible Nova Scotia buyers should arrange for competitive supply through bilateral contracts with eligible sellers.

This recommendation mentions eligible buyers and eligible sellers. The eligible buyers are, as Recommendation 2.1 made clear, wholesale customers in Nova Scotia (the municipal utilities). Eligible sellers could include various kinds of market participants, such as agents, brokers, marketers, and others. These market participants can facilitate transactions because they bring expertise that individual buyers and sellers may not have and they can aggregate many small

transactions into one large economic one. The EMGC therefore recommends that the Nova Scotia market be open to all such participants.

Recommendation 2-5. The EMGC recommends that eligible sellers in the Nova Scotia competitive electricity supply market include generators, cogenerators, importers, and agents, brokers, traders, marketers and aggregators.

3.0 PROMOTING GENERATION FROM RENEWABLES

The *Energy Strategy* states as a principle that renewable energy sources will play an increasingly important role in electricity generation in Nova Scotia. Increased use of renewable energy will provide new business opportunities, increase the efficiency of the electricity system, and contribute to Nova Scotia's commitment to a sustainable energy future.[5]

One of the actions designated to implement this statement is the establishment of the Electricity Marketplace Governance Committee. Policies are needed to promote increased electricity generation from renewable resources because many such resources, such as wind or solar power, are more costly than conventional power sources. Increasing their use requires either mandatory policies that set standards, or voluntary policies that allow consumers who choose to do so, to pay a premium to reduce environmental impacts.

3.1 Renewables and Electricity Restructuring

It is appropriate to combine consideration of environmental policy with electricity market restructuring. In other jurisdictions, when electricity industry restructuring has occurred, policies related to the promotion of generation from renewable resources have also been reviewed and refined. With the transition from vertically integrated monopoly to open competition, old policies frequently become ineffective. Newer, more refined policies, better aligned with the market-oriented structure, are adopted.

As a rule, restructuring an electricity industry can have both positive and negative impacts regarding the use of renewables in electricity generation. On the negative side, as markets become increasingly price-competitive, cost-driven, electricity suppliers are no longer able to roll the added cost of renewables into their overall cost of service. From a positive standpoint, when consumers get greater choice in electricity supply, as occurs with competitive retail markets, they often choose a source of supply with lower environmental impacts, such as renewables, though consumers pay a premium price.

In Nova Scotia, market restructuring will not be extensive initially, so it is likely that previously effective policies will continue to be useful. In spite of that observation, the *Energy Strategy*

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[5] Energy Strategy, Volume 2, Part IV, Pg. 1

identified a number of directions relating to renewables, which the EMGC addressed in the expectation that some new policies would be required in order to promote greater use of renewables.

3.2 Issues Considered

The EMGC, drawing on the *Energy Strategy*, considered two broad policies to promote renewables:

- A voluntary target, to be followed by a longer term Renewable Portfolio Standard; and,
- Green Energy, with access to retail customers by sellers of electricity generated using renewable energy sources.

A renewable portfolio standard, or RPS, requires that some fraction of electricity supply come from sources defined as renewable. The *Energy Strategy* tasked the EMGC with making recommendations for the later implementation of policies, to achieve that goal. Some of the issues encountered in the process of implementing these policy directions concerned either one or both of the issues identified above. However, something common to both is the need to agree on a proper definition, broadly acceptable, of electricity that is produced from renewable resources.

A clear policy, capable of distinguishing electricity derived from renewable sources must possess all of the following:

1. a definition of renewable electricity;
2. a method of certifying which facilities meet that definition; and,
3. a method that permits monitoring of compliance with the definition and the facility that produces the electricity.

Each of these functions must be performed by an authorized entity, but not necessarily the same entity for each function. An agency, or perhaps even a dedicated multi-stakeholder process, could define renewables. Once the definition is clear, other organizations - auditing firms, for example – could certify facilities meeting the definition. Finally, a third entity could monitor compliance and output. Internationally accepted ISO certification is a suitable example, where criteria are clearly spelled out, and several firms are capable of performing certification.

3.3 Definition, Certification and Monitoring

The EMGC dealt first with the issue of definitions and considered three possibilities:

- adopt a definition used elsewhere in Canada;
- adopt a definition used outside of Canada;
- create a definition specifically for use in Nova Scotia.

The EcoLogo® definition, now widely accepted in Canada, is sanctioned by Environment Canada and administered by a private firm, Terrachoice. The relevant EcoLogo® definition, which is for "renewable low impact" electricity generation, is detailed and contains conditions both on the nature of the generation and the process for its approval and installation. Some government programs, including specific federal purchases of renewable resource derived electricity, rely on EcoLogo® certification to identify eligible sources. Because EcoLogo® is so widely accepted, certified

renewable resources in Nova Scotia could readily qualify for sales in neighboring jurisdictions.

The EcoLogo® definition of "renewable low impact" electricity generation was created through extensive discussions with stakeholders. The definition is comprehensive, lengthy and complex, running to 28 pages and covering not only the definition of the source (such as wind or water), but also the process used to harness the resource and convert it into electrical energy. While other options are available, the EMGC felt that adopting a non-Canadian definition might carry the disadvantages of EcoLogo®, without offering the major advantage of consistency with all other Canadian jurisdictions.

There are some concerns associated with the possible use of the EcoLogo® definition and process. First, a private, for-profit company controls EcoLogo® certification, and it was feared that the cost could become prohibitive for some generators. Second, tidal and wave power, existing and potential sources of renewable power in Nova Scotia, are not covered by the existing EcoLogo® definition.

Given the availability of "off the shelf" definitions, which have been tested and accepted by others, it was concluded that the derivation of a uniquely Nova Scotian definition would be prohibitively expensive and time-consuming.

The EMGC Secretariat contacted Terrachoice in order to assess the cost of obtaining and maintaining EcoLogo® certification. Additional information was also obtained regarding the ease with which EcoLogo® would be able to change the definition of low impact renewable generation to include tidal and wave power.

The table below shows the costing information obtained from Terrachoice. Because initial and annual fees have a fixed component, the cost of EcoLogo® as a fraction of total revenues is relatively higher for smaller facilities, as the table shows. A calculation in the table assigns a value to CO2 emissions credits, which the facility probably could not get without EcoLogo® certification. The calculation shows that the credits recover about a fifth of the EcoLogo® costs for the smallest generator while rapidly scaling upward to more than cover the EcoLogo® costs for the larger generators.

EcoLogo®
Verification, Auditing and Annual Licensing Costs

Size (kW)	Initial Audit Cost	Annual Revenues ($k)	Annual Licensing Cost	Annual Total Cost	Cost as % Revenue	Value of CO2 Credits
100	1500	18	1000	1150	6.4%	234
1000	1500	180	1080	1230	0.7%	2344
10000	1500	1802	6802	6952	0.4%	23437

Notes:

1. Initial audit costs waived if facility qualifies for ISO 9000 or 14000
2. Annual revenues calculated at $.06 per kWh at 35% capacity factor

3. Annual total cost is annual licensing cost plus 1/10 of initial audit cost.
4. CO2 credits calculated at $3 per ton for 0.78 kg per kWh displaced.

Given these results, the EMGC recognized that EcoLogo® certification was unlikely to be economic for very small generators but for those of relatively modest size, it could have a positive impact. Therefore, the EMGC agreed to adopt the EcoLogo® definition, with the following recommendation.

Recommendation 2-6. The EMGC recommends that, for all public policy purposes relating to electricity supply, Nova Scotia adopt the EcoLogo® definition of renewable low-impact electricity.

When contacted, Terrachoice advised that the addition of tidal and/or wave resources to the definition of renewable resources for electricity generation would not be unduly difficult, expensive or time-consuming. Since these could be important sources of electricity in Nova Scotia, the EMGC adopted the following recommendation

Recommendation 2-7. The EMGC recommends that the Province of Nova Scotia participate in a process to identify renewable resources of wave and tidal power and other new technologies as renewable low impact electricity under the EcoLogo® definition.

The next step was to identify a monitoring agency. Under the current agreement between Environment Canada and Terrachoice, the company has the exclusive right to certify facilities that meet EcoLogo® criteria. Therefore, if Nova Scotia chose to use a different method of certification it could not use the EcoLogo® name nor claim EcoLogo® certification, even though an auditing agency had certified that the facilities met the criteria.

The Committee did not wish to preclude the province from authorizing some other agency, or from moving to another agency if they deem it to be appropriate.

The EMGC agreed that the adoption of the EcoLogo® definition for policy purposes did not mean that all renewable generators had to be certified as meeting the EcoLogo® standard, only that they met the Nova Scotia definition.

The EMGC also agreed that the EcoLogo® definition was preferred, as an off the shelf tested and accepted definition, but that Nova Scotia would be free to adopt its own means of certifying, recognizing that any such certification would not permit the renewable resource to be called "EcoLogo® ". The generator would be free to have its resource certified as EcoLogo® if it chose to.

Recommendation 2-8. The EMGC recommends that, for all public policy purposes in Nova Scotia, the Nova Scotia government authorize agencies to certify that generation facilities meet the Nova Scotia standard.

Once a facility is certified, it must be monitored to ensure that: a) its operation continues to meet criteria for low-impact renewables generation; and, b) it is generating sufficient electricity to qualify for the credits it receives. Terrachoice monitors certified generators for a flat rate plus a fraction of revenues, and so EcoLogo® can, if necessary, perform the functions of definition, certification, and monitoring. However, consistent with its view that no single agency ought to have a monopoly on these functions, the EMGC did not recommend a specific agency for monitoring. It therefore adopted the following recommendation.

Recommendation 2-9. The EMGC recommends that, for all public policy purposes in Nova Scotia, the Nova Scotia government authorize agencies to monitor that facilities continue to meet the Nova Scotia standard and that sales levels of complying electricity do not exceed production supply levels.

3.4 Renewable Portfolio Standard

A Renewable Portfolio Standard (RPS) is a policy vehicle requiring that a certain fraction of the total electricity supply come from sources defined as renewable. For example, an RPS could mandate that 5% of total electricity supply come from renewable resources by some date. Usually, the stated goal is achieved over a defined period, starting at a low percentage and gradually increasing over the planned duration.

The *Energy Strategy* took a staged approach to introducing an RPS in Nova Scotia. The Province would work with NSPI to implement a voluntary target for 2005, amounting to 2.5% of NSPI's current generating capacity, to come from independent power producers using new renewable resources. The Province and NSPI will monitor the voluntary target for three years, before deciding whether to move to a longer-term mandatory renewable portfolio standard. The *Energy Strategy* did not assign the EMGC a role in designing these programs. However, since the EMGC is a multi-stakeholder group working on electricity market issues, it determined that it could make a useful contribution to the government by providing advice on the development of RPS policies, and its recommendation on the timing and scope of an RPS for Nova Scotia.

The EMGC discussed two approaches to RPS policy delineation: it could recommend to the government that it adopt a firm date on which to implement an RPS; or, it could address many of the issues that are inextricably linked to the establishment of an RPS without recommending a firm date. The Committee chose to address both of these questions, simultaneously.

Many of the issues are the same as set out in previous discussions around renewable energy sources (such as definition, certification and monitoring of renewables), however there are some issues that are unique to this discussion:

- the base level for renewable supply at the start of the RPS;
- whether the RPS requirement identifies a share of energy or capacity;
- definition of the rate of growth of the RPS fraction;
- whether the requirement to meet the RPS target will be placed on loads or generators; and,

- how the requirement will be met, by direct contracts, production of electricity from renewables, or by purchase of the renewable attribute?

3.5 Mandatory Long-Term RPS

The EMGC had extensive discussions on the question of whether or not to recommend a long-term RPS, given that the *Energy Strategy* committed only to three years of monitoring a voluntary RPS before making a decision on a firm program. However, the Committee felt that the EMGC is an appropriate body to decide the merits of a firm RPS, including elements of its design, and consequently initiated several discussions on that topic.

The *Energy Strategy* suggested that the premium price for electricity, derived from renewable resources (under a mandatory RPS), could readily be borne by all NSPI customers, as part of the cost of service base.[6] The cost of an RPS, based upon the model proposed by the EMGC would be determined by the amount of new certified renewable energy that is brought to the market. If new green energy is added to the generation available in Nova Scotia below the amounts required under the mandatory RPS, the cost of the RPS would be high, equal to the penalty cost of non-compliance by distribution utilities. If new green energy is added to the generation available in Nova Scotia more quickly than stipulated by the RPS, the costs would be low, as a function of the competitive nature of more supply than demand.

In the EMGC discussions, the issue of whether or not to adopt an RPS, whether it relates to energy or capacity, its base level and its rate of growth were discussed together as part of a single recommendation.

The Committee had extensive discussions on the question of the appropriate base level for the RPS. The level of generation from renewable sources within Nova Scotia Power was approximately 8.3% of total energy supplied to customers for 2001, the year in which the *Energy Strategy* was released. The current NSPI wind power initiative will add another 0.5%. Some concern was expressed that if the RPS does not distinguish between prior and new generation, and a premium is assigned to it (that is, if the generator was able to sell tags under a voluntary premium price program), the owners of the prior generation will experience a windfall profit. Since the prior generation, as with the bulk of the current NSPI system, was built by or for a regulated entity and paid for by the ratepayers, it could be argued that any increase in the value of those assets should go to ratepayers, not the present owners. (This would be balanced by the fact that if, for example, NSPI was able to generate additional revenue by selling "Green Energy" that came from pre *Energy Strategy* renewable sources, this would be accounted for and returned to customers during any future rate case. The revenue requirement put forward by NSPI would be less than if these additional revenues did not exist.)

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[6] *Energy Strategy*, Volume 2, Part III, Electricity, Pg. 17

Setting the RPS at a zero base avoids the problem of allocating any increase in value of the existing assets but it also gives no credit for the renewable energy produced by those assets.

The EMGC discussed how the RPS requirement should be set. If it was to grow at half the rate of load, and was to be tied to load in each year of the program, in some years there could be problems meeting it, since load growth in Nova Scotia can be "lumpy". The system is small, and new industrial customers can bring a significant percentage increase to the system in one year. If the RPS must track the actual load, a sudden requirement for new generation from renewables could emerge. Consequently, the EMGC concluded that it preferred to state the RPS requirement in terms of a starting level and a requirement for 2010.

An RPS is generally stated as either a percentage of capacity or energy. Many renewable resources are not dispatchable and have lower capacity factors than thermal generators. For example, wind power installations, run-of-the-river hydro generators and solar collectors depend upon the attributes of their respective energy sources. These attributes determine when the facilities will produce electricity.[7] An RPS based on capacity would likely embrace a higher number than one based on energy. Also, a capacity-based RPS would have the further disadvantage that generation from renewable resources could not be guaranteed, only that they would be available.[8] Finally, after considering RPS recommendations set in terms of both capacity and energy, the EMGC concluded that RPS targets should be stated in terms of the latter.

The Committee additionally concluded that the creation of a system employing traded green tags would be better than requiring each responsible entity to own or to contract directly for power from renewable sources. A tag is a certificate that identifies a quantity as having come from a certified renewable resource. Green tags can accomplish the same purpose, and are a more efficient way for all parties to meet requirements.

The requirement to meet the RPS will ultimately be placed on customers. In the Nova Scotia context, the requirement will then fall on the distribution companies, or, more properly, on their load serving function (as opposed to their function with respect to the distribution wires). These are called load serving entities, or LSEs.

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[7] The capacity factor is the ratio of energy actually produced by the facility to the energy that the facility would have produced had it been able to operate at full capacity.

[8] Although it is unlikely that renewable resources such as wind or small hydro would not be running, since they are likely to have the lowest operating costs, with zero fuel costs except possibly for royalties paid for the use of the water.

The Committee adopted the following recommendations.

Recommendation 2-10. The EMGC recommends that the province of Nova Scotia adopt a mandatory RPS to take effect in 2006.

This and the following recommendations resolve many of the high-level issues with respect to the design of an RPS. However, the EMAC recognizes that implementation and adoption of an RPS, as recommended above, will require a process for its further specification.

Recommendation 2-11. The EMGC recommends that electricity from renewable resources have tags that can be created and traded separately from the electricity itself. The tag is a certificate that a quantity of electricity has the attribute of coming from a certified renewable resource.

Recommendation 2-12. The EMGC recommends that entities responsible for acquiring electricity from renewable sources can acquire tags by contracting directly with a certified generator or by acquiring renewable tags.

The next recommendation deals with the base, the target and the method of meeting the requirement. It chooses a base of the actual amount in 2001, the year in which the *Energy Strategy* was introduced, and sets the requirement for 2010.

Recommendation 2-13. The EMGC recommends that the province of Nova Scotia require each LSE to obtain tags certifying that the fraction of its electric energy from renewable sources by 2010 is equal to the actual base of renewable electric energy at 2001 plus 3.2%.

To deal with the potential for windfall profits, the task force recommended that the existing renewable generation be recognized as renewable, but that the renewable aspects be assigned to existing customers.

Recommendation 2-14. The EMGC recommends that the province of Nova Scotia recognize the heritage attributes of renewable generation that existed in December 2001.

Recommendation 2-15. The EMGC recommends that the tags relating to the output of the heritage renewable generators (2001 generation plus NSPI constructed or contracted facilities to 2005), which will be the base electric energy at 2005, be assigned to LSEs as at the RPS implementation date in proportion to their load share.

Since these heritage generators would not receive any monetary benefit from the tags, the EMGC felt they should not have to pay to become certified.

Recommendation 2-16. The EMGC recommends that existing renewable generators a) be exempt from any certification requirements by virtue of their heritage position; and b) that LSEs maintain their proportional rights to the tags from heritage generation.

Once the heritage renewable generators are established, they would not be eligible to sell additional tags unless any additional generation came from a major capital investment.

Recommendation 2-17. The EMGC recommends that heritage facilities be able to create and sell new tags to meet RPS requirements only upon becoming certified as renewable. The new tags would come from either a) incremental increases in production based upon expansion or technology upgrades; or b) the output of a facility that was significantly rebuilt in lieu of facility retirement.

Finally, the normal use of tags to meet the RPS requirement would be new generators.

Recommendation 2-18. The EMGC recommends that new renewable generators within Nova Scotia, on-line after December 2001, be eligible to sell tags to LSE's as the method of meeting the RPS targets.

3.6 Green Energy Marketing Programs

Green energy marketing programs[9] operate on the assumption that energy from renewable resources comes with a higher cost than that obtained from conventional sources. Consequently, consumers who desire to purchase this energy are prepared to pay a premium for it. The design of a program to promote green energy depends on the organization of the market and the nature of the green energy initiatives. Depending on the specific green energy program the consumer premium can be mandatory or voluntary.

Mandatory programs are available to monopoly suppliers. A monopoly utility can purchase green energy from renewable sources at premium prices and then spread the additional costs across its entire customer base, subject to regulatory approval. It could buy the renewables either under compulsion, as from an RPS, or it could do so on its own.

In a voluntary program, a monopoly utility could also act as a retailer of green energy to a single large customer or to a group of customers. It could contract for the green energy and resell it to those specific customers.

A retail green energy program would allow green energy sellers (but not other retailers) to sell either through a monopoly utility or directly to consumers who are willing to pay the green energy premium. Whereas, in a fully competitive retail market a seller offering green energy at a higher price would face price competition from sellers with little or no green energy in their offerings. Consumers could then choose whether or not they wished to pay a green energy premium.

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[9] In this report, the term "green energy" will be used to refer to electricity sold as part of a specific program to offer improved customer access for IPPs selling power from renewable resources.

Green energy programs face the same issues of definition, certification and monitoring as described above for an RPS. Monitoring of actual generation performance is crucial for marketing, because it ensures that the electricity is generated from low-impact renewables, and can prevent a seller from claiming credit for more green power than was actually generated.

Because the definition of renewables, adopted by the Committee, applies to all public policy purposes in Nova Scotia, it would rule for green energy marketing programs. Employing one consistent definition of renewables greatly increases efficiency and reduces confusion.

Several remaining issues relating to the specifics of a green energy marketing program need to be considered. They include: which sellers would be eligible to offer green energy; program design; the role of NSPI in future green energy sales programs; the nature of customer contact; i.e., whether all customers should be eligible to buy green energy and whether the distribution utility should be required to offer billing services.

The purpose of the green energy marketing program is to encourage the development of new generation in Nova Scotia using renewable resources. To be specific about that objective, the EMGC adopted the following recommendation, which acknowledges that the Province does not have full retail competition, and that the green energy is sold to consumers who are willing to pay the premium.

Recommendation 2-19. The EMGC recommends that any seller offering electricity from renewable resources using facilities constructed in Nova Scotia after 2001 be able to sell directly to electricity customers.

The next issue concerns the relationship between green energy buyers and sellers. In a physical bilateral contract market, the seller of green energy would have a contract to supply specific amounts of power to specific customers, which would be difficult and costly to implement. An alternative approach is to use a purely financial contract. With a financial contract, the buyer agrees to pay the seller based upon mutually agreed upon conditions. Those conditions could include a fixed, regular monthly payment, representing the green energy premium on a block of electric energy over the month. It could be a variable amount, based on a premium per unit of energy consumption (kWh). Whatever the basis, buyer and seller agree that the transaction is financial, so it does not necessarily represent the actual timing or amount of electricity that the renewable generator will provide.

Given the complexity and expense of ensuring physical bilateral contracts, the EMGC adopted the following recommendation, which sets financial contracts as the standard but allows particular parties to go beyond that if they agree:

Recommendation 2-20. The EMGC recommends that sellers of electricity from renewable resources sell to electricity customers in Nova Scotia preferably on the basis of financial contracts, although physical contracts are certainly acceptable where the contracting parties can and choose to do so.

Assuming that the relationship between buyers and sellers will be financial, the EMGC considered whether to recommend that the distribution utility, which has direct customer access, provide billing services for the sellers of green energy. The Committee noted that the distributor's billing service would provide that company a benefit when selling its own green energy. With this approach, the customer could still pay only one bill. Further, since the green energy premium would be included with the customer's electricity bill, the distributor can terminate service if the customer fails to make required payments. No independent billing system is able to attain that level of payment certainty.

The Committee therefore adopted the following recommendation which does not mandate an agreement between parties but rather suggests a process based on good faith.

Recommendation 2-21. The EMGC recommends that all electricity distributors in Nova Scotia should discuss access to their billing services in good faith with sellers of green energy, and offer such services on non-discriminatory terms.

The *Energy Strategy* indicates that NSPI should, with the Utility and Review Board, develop green energy rates for all customer classes. At this time, it has received interim approval for a residential green energy rider. The EMGC discussed the future role of NSPI in offering green energy to customers but did not offer any recommendations on this subject. The Committee recognizes that NSPI has already launched contractual discussions for a project to develop renewable energy in Nova Scotia for supply to a specific large customer. NSPI eventually expects to offer similar programs to smaller customers, and that it will be a major participant in this area. It should be noted that NSPI and other distributors enjoy a number of advantages over new entrants. They have strong consumer recognition, good will and regular contact as a result of their ongoing regulated relationship with customers.

The EMGC did have concerns about two possible barriers to the development of green energy. The first is the potential for a system operator or transmission service provider to impose punitive costs on some kinds of renewables generation (such as wind and solar)as a consequence of their variability and relative unpredictability in output. Such renewable resources have to be treated by the system operator as special cases. For example, in a system where bilateral contracts have to be filed two days in advance and the responsible party can be assessed penalties for large deviations from the scheduled electricity injections, penalties could be heavy for some kinds of green energy, like wind or solar.

The second possible barrier is the potential for an incumbent utility to impose unduly high connection costs on small scale renewable generators. This can come about when connection standards are designed with large facilities in mind, and when performance standards and other measures are more exacting than need be. A task force currently underway in the United States is developing a connection code which would likely be widely applied in North America, including presumably, Canada. NSPI is currently working on an integrated approach for small generators.

Consequently, the EMGC adopted the following recommendation:

Recommendation 2-22. The EMGC recommends that transmitters and distributors in Nova Scotia adopt connection standards for small-scale generation that properly reflect the size and potential system impact of the facility.

3.7 Net Metering

Net metering lets customers with their own generating capacity move electricity into the distribution system when they have energy surplus to their own needs. On those occasions, their electric meters run backwards. Consequently, at the end of a billing period the meter will only reflect the net energy drawn from the supplier. Net metering programs apply only to small generators who are connected to a distribution system.

The *Energy Strategy* did not take a position on net metering. It did note that NSPI is currently working with equipment suppliers to develop a net metering policy, and it enumerated some benefits of such a policy. The *Energy Strategy* did not restrict net metering access to renewable sources, but it did mention wind, solar and mini-hydro as the most likely sources.

The EMGC embraced net metering as an additional important tool to promote renewables, so it greatly favored limiting its application to those sources. Issues identified as important relative to net metering included:

- technology restrictions;
- limits on size of units;
- aggregate fraction of distribution utility supply limits;
- period for netting out;
- disposition of net energy generated (NEG), and,
- rules for connection.

In a net metering program, the distribution utility effectively buys power from the net-metered customer when its meter is running backwards (there are also other options but this is the most common). The price paid for that electricity by the utility is its full retail price, since the power is netted out against sales that would take place at that price. Clearly, the distributor loses money on these transactions, since there is no allowance for its costs. Therefore, net metering programs typically face limits, both on the size of the individual generators and on the aggregate fraction of the host utility's supply that net metering can represent.

Any net metering application can produce net energy generation (NEG). That occurs when the total energy delivered from the generator is greater than the total taken from the distributor. The design of a net metering program must consider two questions that relate to this issue of NEG, namely, over what interval is the net energy calculated, and what is its eventual disposition? And, finally, some technical issues relate to the conditions of linkage to the host utility, in terms of connection and metering standards.

To review net metering practice in other jurisdictions, the EMGC received a report surveying all states in the United States with net metering programs. That survey addressed most of the issues identified above, and showed that their practice varied across jurisdictions, which was useful when considering possible policy changes for Nova Scotia.

The EMGC noted that the *Energy Strategy* stated that NSPI would establish standards and other conditions for net metering. Therefore, the Committee's function is to make recommendations to assist with the implementation of these plans.

The first question was eligibility for net metering programs. One consideration is the actual technology that is employed, with a clear Committee bias toward renewables. A second emerged from an earlier discussion, on the definition of renewables for public policy purposes, where the EMGC concluded that formal certification is not likely to be cost-effective for generators less than 100 kW. A third condition for eligibility is the technical compatibility of the net metering application and that of its host utility. These and other conditions between the utility and the net-metered generator would be contained in an operating agreement, agreed to by both parties. If the generator chooses not to be certified, the distribution utility would make the determination of whether it meets the criteria for renewable generation. These conditions are expressed in the following recommendation:

Recommendation 2-23. The EMGC recommends that a qualifying generator be one with a suitable interconnection and operating agreement, using renewable resources for generation.

NSPI's current policy for net metering, presently under review, sets a size limit of 10 kW. A survey of practice in the United States showed that the largest eligible size is 100 kW (excepting California, where it is 1 MW). NSPI reported that potential generators with projects as small as 50 kW wished to negotiate power purchase agreements, since they are excluded from net metering under current rules. However, these projects are generally smaller than is desirable for a power purchase agreement, so that an increase in the maximum allowable net metering size would alleviate this problem.

Taking these factors into consideration, the EMGC approved the following recommendation:

Recommendation 2-24. The EMGC recommends that qualifying generators with installed capacity of 100 kW or less, connected to a distribution system, be eligible for net metering programs.

In addition to individual net metering size limits, the EMGC recognized that an aggregate limit was necessary in order to protect the interests of the distribution utilities. This limit could be placed on total net metering installations either as a fraction of the demand, or as a fraction of energy.

The following recommendation is consistent with practice in other jurisdictions and expectations from the distribution utility representatives on the Committee.

Recommendation 2-25. The EMGC recommends that no distributor in Nova Scotia be required to accept net metered installations having a total installed capacity of more than 0.5% of the annual peak demand.

The United States survey showed a wide range of practice with respect to NEG. The period for netting energy and for billing ranged from monthly to annual to indefinite carry overs. The treatments of NEG included paying at utility avoided cost, paying at a premium to utility avoided cost, and letting NEG revert to the utility for no payment. The full retail rate paid for net metered energy represents a clear benefit to the net metered customer. Allowing NEG to carry over from month to month could also benefit the customer in jurisdictions with seasonal pricing. It allows the customer to over generate in months when electricity prices are low and receive full credit in months when electricity prices are high.

Given the benefit to the generator of net metering, the EMGC agreed to balance that off by having NEG revert to the host utility without payment. However, the recommendation uses a rolling 12-month netting period, as shown in the following recommendation. In effect, from the 13th month forward there is a monthly reset of the credits to zero for the first month. The recommendation also recognizes the role of the Utilities and Review Board in approving conditions that would affect rates.

Recommendation 2-26. The EMGC recommends that, subject to approval by the Utility and Review Board, excess energy delivered to the distributor from net metering installations can be carried over to subsequent billing periods, for up to 12 months. At the end of each rolling 12-month period, excess energy credits are set to zero without compensation to the generator.

The remaining topics address the technical standards for installation of generation facilities to be accorded net metering. Host utilities have a responsibility to maintain reliability and safety of their systems, and they must set minimum performance standards for net metering applications. These should not be made so onerous that they become a barrier to new net metering applications. For example, insisting on the same level of protective circuitry as for a large-scale generator would make net metering applications uneconomic. Such a technical requirement is excessive, given the limited potential for generation of net metered size to impact the reliability of the distribution system.

Net metered applications do need to meet system specifications. For example, if a distribution utility were to take a transmission line out of service for maintenance, and that line was activated by energy entering the system from a net metered application, it might pose a serious safety hazard for the utility personnel.

The following two recommendations deal with technical standards issues for connection using net metering applications. They recognize the current NSPI discussions and reflect the awareness that technical standards must be reasonable relative to the size of the applications.

Recommendation 2-27. The EMGC recommends that NSPI expeditiously finalize the connection standard(s) currently under development for small generators connected to a distribution system.

Recommendation 2-28. The EMGC recommends that distribution utilities in Nova Scotia be required to adopt technical standards for net metering installations that properly reflect the size of the installation and its potential impact on the system.

Because they will be constrained to use renewable energy sources, net metering applications in Nova Scotia could be eligible for emissions credits or allowances under a program to reduce air emissions in Nova Scotia, or under climate change initiatives. It may not be practical for net metering applications to get these credits, because of the requirement for certification and its cost relative to the small size of generator.

As an offset to the benefit net metering applications get from the host distribution utilities, the EMGC adopted the following recommendation.

Recommendation 2-29. The EMGC recommends that the host distributor be entitled to any emissions credits or allowances arising from the use of renewable energy sources to generate power in connection with a net metering installation.

4.0 ENERGY EFFICIENCY

The *Energy Strategy* did not elaborate a role for the EMGC in promoting energy efficiency programs. It declared that "government will encourage NSPI and the UARB to develop creative Demand Side Management (DSM) and Systems Benefit Charge (SBC) programs to improve electricity efficiency and reduce overall consumption."[10] The *Energy Strategy* 's treatment of energy efficiency focused primarily on several programs, not specifically aimed at the electricity industry, such as government energy use, appliance and building codes and standards.

The EMGC considered six possible actions, which are not necessarily mutually exclusive, regarding the subject of energy efficiency:

1. Offer no recommendation or comment;
2. Recommend government support for the principles of DSM and SBC;
3. Recommend basic principles for program development.
4. Recommend implementing a DSM program.
5. Recommend a specific funding mechanism, such as SBC.

[10] *Energy Strategy*, Volume 2, Part III, Electricity, Pg. 19

6. Recommend some specific DSM measures, such as building envelope improvements.

The EMGC recognized, during the course of its discussions regarding promotion of energy efficiency, that programs like DSM require targeted funding mechanisms, such as SBC. This is especially true if the intent is to fund the program within the electricity industry, where some increase in electricity costs will need to be passed on to some consumers. The EMGC was reluctant to increase energy costs, seeing ita s a tax on electricity consumers, in order to fund energy efficiency programs to benefit other consumers. Even assuming that the proposed cost increase was confined only to the customer class eligible for energy efficiency programs, the EMGC felt that such a policy would be inappropriate.

At the same time, the EMGC recognizes the importance of policies concerned with energy efficiency. Satisfying energy end-use needs by reducing demand reduces fuel consumption and its associated environmental impact. However, changing to more efficient forms of generation is only a partial solution.

One of the major barriers to the adoption of energy efficient technology is the cost of acquiring relevant information. The *Energy Strategy* proposed government information and audit programs along with encouragement of energy service companies (ESCOs) as two possible approaches to overcome this barrier. The EMGC also recognizes the importance of information cost barriers and the government's potential role in overcoming them. The Committee also noted that other Canadian governments, provincial as well as federal, already offer information programs to promote energy efficiency. Coordinating with and leveraging such programs could help Nova Scotia achieve greater efficiencies and success with its own programs. The EMGC therefore adopted the following recommendation.

Recommendation 2-30. The EMGC recommends that the government of Nova Scotia maintain information programs to help users implement energy efficiency. The programs should be coordinated with those of other governments, wherever possible.

After considering other recommendations, including possible principles for the design of energy efficiency programs and support for the *Energy Strategy* suggestion of an SBC or other funding mechanism for DSM programs, the EMGC clearly opposed any program that compelled electricity consumers to pay for energy efficiency programs. It made this position clear in the following recommendation.

Recommendation 2-31. The EMGC recommends that the province not implement a systems benefits charge or other general funding mechanism which requires electricity customers to pay for energy efficiency programs.

APPENDIX A

Summary of Recommendations

First Interim Report

Transmission Issues

Importance of Transmission (Section 5.1)

Recommendation 1-1. The EMGC recommends that NSPI develop and file a transmission tariff.

Recommendation 1-2. The EMGC recommends that any transmission tariff developed for use in Nova Scotia ensure open and non-discriminatory transmission access for all market participants.

Transmission Tariff Options (Section 5.2)

Recommendation 1-3. The EMGC recommends the development of a transmission tariff for Nova Scotia which should initially include a scheduling and information system which need not be an OASIS.

Recommendation 1-4. The EMGC recommends that transmission tariffs in Nova Scotia develop towards eventual FERC compatibility.

Transmission Services Offered (Section 5.3)

Recommendation 1-5. The EMGC recommends that transmission services that are to be offered under the transmission tariff should initially include:

- ***Network Integration Service for the delivery of both capacity and energy for the supply of load located within the control area .***
- ***Point-to-Point service for the reservation of transmission capacity from a specific point of receipt to a specific point of delivery. (Point-to-Point service would be offered on both a firm and non-firm basis).***

Recommendation 1-6. The EMGC recommends that the transmission tariff require the system operator to offer each of the following ancillary services:

- ***scheduling, control and dispatch***
- ***reactive supply and voltage control***
- ***energy imbalance***
- ***regulation and frequency response service***
- ***operating reserve - spinning reserve***

- ***operating reserve - supplemental***

Definition of Transmission - Radials (Section 5.4.2)

Recommendation 1-7. The EMGC recommends using the following principles to determine whether the costs of transmission facilities should be included in the transmission tariff:

- ***The cost of a transmission facility used solely by one party should be assigned or charged to that party.***
- ***The cost of transmission facilities that are not part of the transmission backbone should be directly assigned or charged to those parties that use them. The preferred alternative for realizing this objective is:***
  - ***Costs for radial lines serving generators be assigned to those generators***
  - ***Costs for generation step-up transformers be assigned to those generators***
  - ***Costs for radial lines serving distribution loads be assigned to distribution***
  - ***The revenue requirement to be recovered uniformly from all distribution level customers, supplied by both NSPI and the municipal utilities.***

Charge determinants (Section 5.4.3)

Recommendation 1-8. The EMGC recommends that transmission revenue requirements be allocated based on the average twelve monthly coincident peaks.

Billing Determinants (Section 5.4.4)

Recommendation 1-9. The EMGC recommends that the billing determinants to establish transmission charges for network customers be monthly net non-coincident peak demand and that for point to point customers it should be reserved capacity (estimated on a net load basis, if necessary.) The charge basis for existing self-generation customers would be hourly net non-coincident peak.

Rates - Location and Voltage (Section 5.4.5)

Recommendation 1-10. The EMGC recommends that the transmission tariff rate design be based on a consistent charge regardless of the location of the connecting customer, and that in addition new transmission customers be assessed locational factors relating to transmission losses, which may be negative or positive.

Management and Internal Congestion (Section 5.5.1)

Recommendation 1-11. The EMGC recommends that all existing customers share the congestion costs on the existing system.

Recommendation 1-12 The EMGC recommends that new generators and major loads be required to pay:

- ***All costs to connect to the transmission network.***
- ***All costs of system upgrades required to mitigate congestion costs that they would otherwise create.***
  - ***Generators who agree to be constrained down if this alleviates the congestion to a level consistent with what previously existed will not be charged for additional congestion costs.***
- ***Any direct transmission system benefits from the investments charged to the generator or load (e.g., reduced losses or reduced congestion costs that are borne by other parties) will be paid to the generator or load.***
- ***Any direct benefits or costs due to the impact of the new generation or load on total system losses will be paid or charged to the new generation or load.***
- ***The generator will be responsible only for the cost of advancing construction facility upgrades if the transmission service provider has previously identified them as required for reliability purposes.***

<u>Transmission Rights on the Interties (Section 5.5.2)</u>

Recommendation 1-13. The EMGC recommends that Nova Scotia maintain a system of import and export transmission rights for electricity and capacity.

Recommendation 1-14. The EMGC recommends that the system of transmission rights be designed to preserve the heritage benefits of transmission interconnections.

Summary of Recommendations

Second Interim Report

Market Scope (Section 2.5)

Recommendation 2-1. The EMGC recommends that Nova Scotia's initial market opening, to encourage electricity competition, be restricted to wholesale customers, who will then be eligible to purchase electricity from any competitive supplier; and that any seller, offering electricity generated from renewable resources located in Nova Scotia, be able to sell directly to consumers.

Recommendation 2-2. The EMGC recommends that the Government of Nova Scotia begin a detailed quantitative analysis of the costs and benefits associated with broader electricity competition in the Province. Such an analysis is necessary for any further stakeholder and/or government consideration to broadening electricity competition

Recommendation 2-3. The EMGC recommends that the Government of Nova Scotia resume deliberations, regarding the possibility of broader electricity competition, when the cost and benefit analysis has been completed.

Market Model (Section 2.6)

Recommendation 2-4. The EMGC recommends that eligible Nova Scotia buyers should arrange for competitive supply through bilateral contracts with eligible sellers.

Recommendation 2-5. The EMGC recommends that eligible sellers in the Nova Scotia competitive electricity supply market include generators, cogenerators, importers, and agents, brokers, traders, marketers and aggregators.

Definition, Certification and Monitoring (Section 3.3)

Recommendation 2-6. The EMGC recommends that, for all public policy purposes relating to electricity supply, Nova Scotia adopt the EcoLogo® definition of renewable low-impact electricity.

Recommendation 2-7. The EMGC recommends that the Province of Nova Scotia participate in a process to identify renewable resources of wave and tidal power and other new technologies as renewable low impact electricity under the EcoLogo® definition.

Recommendation 2-8. The EMGC recommends that, for all public policy purposes in Nova Scotia, the Nova Scotia government authorize agencies to certify that generation facilities meet the Nova Scotia standard.

Recommendation 2-9. The EMGC recommends that, for all public policy purposes in Nova Scotia, the Nova Scotia government authorize agencies to monitor that facilities continue to meet the Nova Scotia standard and that sales levels of complying electricity do not exceed production supply levels .

Mandatory Long-Term RPS (Section 3.5)

Recommendation 2-10. The EMGC recommends that the province of Nova Scotia adopt a mandatory RPS to take effect in 2006.

Recommendation 2-11. The EMGC recommends that electricity from renewable resources have tags that can be created and traded separately from the electricity itself. The tag is a certificate that a quantity of electricity has the attribute of coming from a certified renewable resource.

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Recommendation 2-16. The EMGC recommends that existing renewable generators a) be exempt from any certification requirements by virtue of their heritage position; and b) that LSEs maintain their proportional rights to the tags from heritage generation.

Recommendation 2-17. The EMGC recommends that heritage facilities be able to create and sell new tags to meet RPS requirements only upon becoming certified as renewable. The new tags would come from either a) incremental increases in production based upon expansion or technology upgrades; or b) the output of a facility that was significantly rebuilt in lieu of facility retirement.

Recommendation 2-18. The EMGC recommends that new renewable generators within Nova Scotia, on-line after December 2001, be eligible to sell tags to LSE's as the method of meeting the RPS targets.

Green Energy Marketing Programs (Section 3.6)

Recommendation 2-19. The EMGC recommends that any seller offering electricity from renewable resources using facilities constructed in Nova Scotia after 2001 be able to sell directly to electricity customers.

Recommendation 2-20. The EMGC recommends that sellers of electricity from renewable resources sell to electricity customers in Nova Scotia preferably on the basis of financial contracts, although physical contracts are certainly acceptable where the contracting parties can or choose to do so.

Recommendation 2-21. The EMGC recommends that all electricity distributors in Nova Scotia should discuss access to their billing services in good faith, with sellers of green energy and offer such services on non-discriminatory terms.

Recommendation 2-22. The EMGC recommends that transmitters and distributors in Nova Scotia adopt connection standards for small-scale generation that properly reflect the size and potential system impact of the facility.

Net Metering (Section 3.7)

Recommendation 2-23. The EMGC recommends that a qualifying generator be one with a suitable interconnection and operating agreement, using renewable resources for generation.

Recommendation 2-24. The EMGC recommends that qualifying generators with installed capacity of 100 kW or less, connected to a distribution system, be eligible for net metering programs.

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Recommendation 2-28. The EMGC recommends that distribution utilities in Nova Scotia be required to adopt technical standards for net metering installations which properly reflect the size of the installation and its potential impact on the system.

Recommendation 2-29. The EMGC recommends that the host distributor be entitled to any emissions credits or allowances arising from the use of renewable energy sources to generation power in connection with a net metering installation.

Energy Efficiency (Section 4.0)

Recommendation 2-30. The EMGC recommends that the government of Nova Scotia maintain information programs to help users implement energy efficiency. The programs should be coordinated with those of other governments, wherever possible.

Recommendation 2-31. The EMGC recommends that the province not implement a systems benefits charge or other general funding mechanism which requires electricity customers to pay for energy efficiency programs.

APPENDIX B

Glossary

Agent
Buys or sells on behalf of trader.

Aggregator, Broker, Marketer, Agent & Trader
A profit-motivated entity that acts as an intermediary in arranging transactions between, or on behalf of, generators and customers. It may assemble load or generation into larger blocks (aggregator), act as a negotiator between buyers and sellers (broker), or buy, sell and take physical positions in the marketplace (marketer).

Ancillary Services
Ancillary services are those services necessary to support the transmission of energy from resources to loads while maintaining reliable operation of the transmission system. Ancillary services typically include operating reserves, regulation and frequency imbalance, scheduling, control and dispatch, and voltage support and control. FERC Order 888 named energy imbalances as an ancillary service.

Available Transfer Capability (ATC)
A measure of the remaining physical capability in a transmission network for commercial activity, over and above that already committed to users. Already committed uses would include commitments for both system reliability and commercial transactions.

Backup Supply Service
The provision of capacity and energy to a market participant, either when needed to replace the loss of its generation sources, or to cover that portion of demand that exceeds the generator's capacity to supply for more than a short time.

Baseload Capacity
That category of generating capacity, because of its low operating costs, tends to operate continuously and steadily. Its output is generally not varied to follow changes in demand

Bilateral Contract Market
A market with direct contracts between buyers and sellers to obtain generation and/or ancillary services of a given type, duration, timing and reliability over a contractual term. A bilateral contract market is an alternative to using a centralized power pool or organized exchange auction to make purchases or sales of power or ancillary services.

Black Start Capacity
An ancillary service that provides an offsite source of power to enable a Control Area to restore its system, or enables a generator to start its generating units or restore service to its customers if local power is not available. Sometimes referred to as restoration service.

Bus
An electrical connection point between different parts of the interconnected system, such as the connection between a generating facility and the transmission grid in a power station switchyard. Also referred to as a "node."

Capability
The maximum load that a generating unit, generating station, or other electrical apparatus can carry under specified conditions for a given period of time without exceeding approved limits of temperature and stress.

Capacity
The maximum power that a generating unit, generation station, or other electrical apparatus can supply, usually expressed in megawatts.

Co-generator
A generating facility that produces electricity and another form of useful thermal energy (such as heat or steam) used for industrial, commercial, heating, or cooling purposes.

Congestion
The conditions under which the transactions that market participants wish to implement exceed the transfer capability of the transmission grid. Congestion usually requires the system operator to adjust the output of generators, decreasing output in one area to relieve constraint while increasing it in another to continue to meet customer demand.

Congestion Pricing
A method of pricing in which all energy bought and sold in the operator-administered spot market settles at market-based prices that account for the effects of congestion. Settlement prices are determined from the marginal cost (price) of serving an increment of load at each location.

Coincident Peak
The amount of metered demand at the time of the system peak. Monthly coincident peak is at the time of monthly peak.

Connection Asset
Any line, transformer or other piece of transmission equipment that is required to connect a generator or load to the common transmission grid. Typically, connection assets are used by only one to several entities, and electrical flows tend to be in one direction only.

Constraint
A restriction on a transmission system, or segment of a transmission system, that may limit the ability to transmit power between, and hence to inject or withdraw power at, various locations. Constraints may be the result of physical limitations, such as the thermal limits of a transmission line or local voltage and stability restrictions, but can also include contingency limits, that *assure* secure operations in the event of an unexpected failure of a transmission or generation facility.

Control Area
A region on the electricity grid where supply and demand are kept in balance through dispatch by the system operator.

Cost of Service Regulation (See **Rate of Return Regulation**)

CO_2 emission reduction credits
An emissions credit is measured in metric tons (mt) of carbon dioxide equivalent (CO2e). Credits are emission reductions that an emitter has achieved in excess of any required reductions. The excess amount is the credit and can be sold on the market. Individual emission credit allowances will be set by individual governments based on their target agreements. Companies that have surplus emissions credits can sell them to another that has exceeded its emission output.

Decommissioning
The act of permanently removing a facility from service. In the case of a nuclear plant this includes safely closing, and possibly dismantling (or otherwise disposing of) the existing facilities at the end of their service life.

Demand Side Management (DSM)
Measures undertaken to control the level of energy usage at a given time, by increasing or decreasing consumption or shifting consumption to some other time period. Consumers, utilities or third parties can undertake DSM efforts.

Direct Load Control
Refers to program activities that can interrupt consumer under direct control of the utility system operator. This type of control usually involves residential consumers. Direct Load Control excludes Interruptible Load and other Load Management effects.

Dispatch
The process by which the System Operator directs the real time operation of a supplier or a purchaser to cause a specified amount of electric energy to be provided to or taken off of the system. Dispatch control includes instructions to synchronize, desynchronize, increase or decrease electrical output and any other instruction relevant to maintaining system security.

Dispatchable Demand
Customer demand that can be adjusted in response to dispatch directions from the System Operator.

Eligible Customer
A customer who is eligible, under the market design in Nova Scotia, to choose to buy electricity from any supplier.

Embedded Generation
Generation that is not directly connected to the transmission grid, and is usually within a distribution system.

End-use Consumer or Customer
A residential, commercial, or industrial customer in the energy marketplace who buys energy for its own consumption and not for resale.

Energy efficiency
Using less energy/electricity to perform the same function. Also refers to programs designed to use electricity more efficiently -- doing the same with less.

Energy Imbalance Service
Provides correction for any hourly mismatch between a transmission customer's energy supply and the demand the customer is obligated/contracted to serve.

Energy Service Company
An organization that contracts with energy users, their agents, and utility companies, to evaluate, design and install capital and operating improvements to an existing building facility or industrial process, to reduce energy and operating costs over a contract period.

Enforceable
With reference to agencies being charged with monitoring and enforcing the Market Rules and protocols the agency must have the power to impose sanctions on market participants who violate the Market Rules and the process of investigation of breaches of Market Rules and protocols must be transparent.

Fairness
With reference to the market design in relation to participants and category of participants the market design should not artificially discriminate. In addition actions taken to enforce the market rules should follow written rules and protocols.

FERC
Federal Energy Regulatory Commission. Federal counterpart to state utility regulatory commissions in the United States that regulates the price, terms and conditions of power sold in interstate commerce and regulates the price, terms and conditions of all transmission services. FERC's Order 888, issued in 1996, defines the requirements under which regulated monopolies and power pools must provide non-discriminatory access to participants engaging in wholesale transactions.

Financial Bilateral Contract
A form of agreement between two parties to trade electricity at a price determined by the parties. Also known as a Contract for Differences.

Firm Transmission Service
Point-to-point transmission service that is reserved and/or scheduled that is of the same priority as that of the transmission provider's firm use of the system.

Generator
An entity that owns and operates an electricity generation facility.

Governance
The process and structure used to direct and manage the business and affairs of a corporation with the objective of enhancing shareholder value, which includes ensuring the financial viability of the business.

Green Energy
Electricity produced from renewable resources such as wind, small run-of-the-river hydro-electricity or solar energy. It is sold to customers who wish to contract for power from such resources, typically at a premium price.

Greenfield Investments
Investments in new generation or transmission facilities that are located on new sites, rather than at sites with existing facilities.

Green Tag
A tag representing the production of a fixed amount (one MWh.) of electricity from renewable resources, as certified by EcoLogo®. Buying green tags is a way to support electricity generation from renewable sources.

Gross Load
Within a distribution system, the total load, including that served by embedded generation.

Heritage Facilities
The physical electricity supply system in existence at the time of electricity restructuring. These physical facilities were acquired under a regime in which the owner was effectively granted a regulated rate of return. It can be argued that the benefit, if any, these facilities have after a move to a competitive market should belong to the customers, not to the owners, since the customers ultimately bore the risk.

Incumbent Utility
The existing utility that serves customers, and in some instances may benefit from its existing customer relationships.

IPPs
Independent Power Producers. Generators owned by entities other than an electric utility.

Independent System Operator (ISO)
A system and market operator, who is independent of other market interests, i.e., has no ownership interest in the transmission facilities and no vested interest in specific market outcomes.

Integrated System
The electric system encompassing generation, loads, transmission and distribution facilities.

Interface
The set of transmission interconnections between any two regions.

Intermittent Power Source
A generator, such as a wind turbine, whose output may vary considerably over short periods due to the variability and unpredictability of its external energy source.

Intertie
A transmission line that connects two adjacent control areas.

Interruptible Load
Arrangements made between consumers and the System Operator in which the consumer agrees to shed load at the direction of the System Operator, in exchange for compensation. Customers may offer this load to the System Operator as Operating Reserve.

Interval Meter
An electricity meter that is able to record and track a customer's electricity consumption over time so that the consumption in each unit of time can be matched with the cost of power during that period of time.

Kilowatt-hour (kWh)
A standard unit for measuring electricity. Residential customers' rates are usually expressed in cents per kilowatt-hour.

kWh Metering
Metering capable of measuring the total usage or flow of kilowatt-hours on a continuing basis, but not capable of recording and tracking such usage over shorter intervals, such as every hour.

LBMP
Location-based marginal pricing. (see LMP)

LDC
Local Distribution Company. An entity that owns a distribution system for the local delivery of energy to consumers.

Least-Cost Dispatch
The scheduling of power production as demand for electricity varies, according to the lowest cost generation sources available to the System Operator, given transmission limits and other constraints.

Light-Handed Regulation
A streamlined regulatory method designed to speed up the process and reduce the cost while balancing the interests of the various parties and allowing the regulator to carry out its statutory duties.

LMP
Locational marginal pricing, or locational pricing. A form of congestion pricing that determines the price of energy at locations on the grid as the marginal cost of serving an increment of load at those different locations.

Load
The amount of electric power delivered or required at any specific point or points on a system. The requirement originates at the energy consuming equipment of the consumer.

Load Profile
An approximation of the amount of energy typically taken during each hour by a consumer or class of consumers over a defined period, such as monthly, given the total amount of energy metered for that defined period. Load profiles are needed for consumers who do not have interval meters, and are used to allocate total kWh usage over the month to each hour, in order to perform settlements that are based on hourly prices.

Load Shedding
The process by which the system operator deliberately removes (either manually or automatically) preselected customer demand from the power system in response to an abnormal condition to maintain the integrity of the system and minimize overall customer outages.

Loop Flow
Unscheduled flow that arises from the physical nature of electricity whereby it follows the path of least resistance. Loop flow occurs on transmission paths other than the path contracted for by transacting parties. Also referred to as parallel path flow.

Losses
The energy that is consumed (lost) in the transmission and distribution of electricity from generation to load.

LSE
A load-serving entity. Historically, electric utilities that had an obligation to serve consumers. An LSE can be distribution utility if it supplies energy in addition to wires services and competing entities that take on a contractual obligation to serve retail consumer.

Market Concentration
A measure of how market share is distributed among competing firms

Market design
The design of a market describes the elements in the market which perform the basic market functions of determining which loads are dispatched to which customers and at what price.

Market Model (Wholesale)

A theoretical description of the structure and functions of a wholesale electricity market.

Market Participant
Any entity that is authorized by the market rules to produce, buy, sell, trade, or transmit energy and/or ancillary services.

Market Power
The ability of a seller, or group of sellers acting in concert, to profitably maintain prices above competitive levels for a significant period of time.

Market Power Mitigation
The means by which a firm's ability to exercise market power is discouraged, limited or prevented.

Market Scope
Amount or share of the total electricity demand that is open to competitive supply.

Market Share
An individual firm's share of the total market sales revenues.

Market Structure
The number and relative sizes of participants in a market, both buyers and sellers.

Market Transparency
The ability of market participants to observe and understand the workings of the market.

Megawatt (MW)
Unit of electrical power, used to measure the generating capability capacity of a generating station or the maximum demand of an electricity consumer.

Megawatt-hour (Mwh)
A measure of the energy produced by a generating station over time: one megawatt of power produced for 24 hours provides 24 megawatt-hours of energy (as does 24 megawatts produced for one hour).

Merchant Generator / Plant
An electric generating facility that is built without any sales commitments.

Meters or Metering
Equipment that measures and registers the amount and direction of energy quantities over a period of time.

Monopoly
A single firm which is the sole producer of a commodity for which there is no close substitute.

Monopsony
A market characterized by a single buyer of a product. See Single Buyer Market

Native Load
The wholesale and retail customers on whose behalf the Transmission Provider, by statute, franchise, regulatory requirements, or contract, has undertaken an obligation to construct and operate the Transmission Provider's system to meet the reliable electric needs of such customers.

NEPOOL
New England Power Pool.

NERC
North American Electric Reliability Council. An association of electric utilities established in 1968 in response to the 1965 blackout in the Northeastern U.S. and Ontario. Through the work of 10 regional councils and one affiliate council, NERC members ensure the reliability of the integrated North American bulk power system. NERC develops standards, guidelines and criteria for assuring system security and evaluating system adequacy, and has succeeded in maintaining a high degree of grid reliability throughout North America.

Net Coincident Peak
The amount of metered energy at the time of the system peak, net of any self-generation.

Net Energy Generation(NEG)
For a net metered application, the amount by which generation exceeds demand in a given time period.

Net Metering
In many jurisdictions, electricity customers are allowed to produce their own electricity through renewable energy sources and "sell back" any unused capacity to their local utility grid. Put simply, net energy metering means that any kilowatt-hours produced and fed back into the grid by a customer are subtracted from the kilowatt-hours of electricity obtained from the utility, resulting in net kilowatt-hours.

Network Integration Service
Transmission service that allows a transmission customer to integrate, plan, economically dispatch, and regulate its network resources to serve its network load in a manner comparable to that in which the transmission provider utilizes its transmission system to serve its native load customers. Network Integration Transmission Service also may be used by the transmission customer to deliver non-firm energy purchases to its network load without additional charge.

Network Transmission
All transmission facilities 69kV and above, except those radial circuits with uni-directional flow (serving single customers, single generation facilities, or distribution substations)

Non-Discriminatory Access
The rules that assure that all market participants have access to the market, the transmission system, distribution systems and ancillary services under the same terms and conditions, with no preferential treatment for those entities who may own, or be affiliated with the owners of, transmission system or distribution system assets.

Non-Firm Transmission Service
Point-to-point transmission service that is scheduled and paid for on an as-available basis and is subject to interruption.

Non-Utility Generators (See IPPs)

OASIS (Open Access Same-Time Information System)
The information system and standards of conduct contained in Part 37 of the Federal Energy Regulatory Commission's regulations and all additional requirements implemented by subsequent Commission orders dealing with OASIS. The OASIS will provide information by electronic means about available transmission capability for point-to-point service and will provide a process for requesting transmission service. OASIS will enable Transmission Providers and Transmission Customers to communicate promptly requests and responses to buy and sell available transmission capacity offered under the Transmission Provider's tariff.

OATT (Open Access Transmission Tariff)
The terms and conditions of OATTs were established by FERC Order 888. The primary objective of an OATT is to ensure that transmission service providers offer transmission service to others under equivalent terms and conditions as it provides such service to itself and its affiliates.

Option
A contract that gives the right, but not the obligation, to buy a commodity or asset for a fixed price at, by, or before a specific date.

Peaking Capacity
Generating capacity typically used only to meet the peak demand, the highest demand for electricity during the day. Peaking capacity is typically provided by hydroelectric generators or gas-fired combustion turbine generators.

Peak Load/Peak Demand
The electric load that corresponds to a maximum level of electricity demand in a specified time period.

Physical Bilateral Contract
An agreement between two parties to trade a specified quantity of electricity at a price determined by the parties. One of the parties will schedule with the system operator for the delivery into the system at a fixed point (or points) and withdrawal from the grid of a corresponding amount at a fixed point (or points).

Point-to-Point Service
Point-to-point service provides a customer the ability to use only that portion of a transmission owner's integrated facility to input power at a specified point and take out the power at a specified point regardless of actual flow.

Power Marketers
Business entities engaged in buying and selling electricity, but which do not own generating or transmission facilities.

PPA (Power Purchase Agreement)
An agreement that set forth the terms and conditions for the sale of power.

Projected Marginal Energy Cost
The projected sum that has to be paid for the next increment of product or service. The marginal cost of electricity is the price to be paid for kilowatt- hours above and beyond those supplied by available generating capacity.

Ramp Rate
The rate, expressed in megawatts per minute, at which a generator can increase or decrease its output.

Rate
The price charged for a commodity or service. Rates may be subject to regulatory approval or may be set by the marketplace.

Rate of Return Regulation
Process of regulation whereby the regulator sets rates at a level that will cover operating costs and provide an opportunity to earn a reasonable rate of return on the invested property devoted to the business. Also known as Cost of Service Regulation.

Reciprocity
A mutual exchange of privileges. With respect to electricity trade, reciprocity gives market participants in one jurisdiction the right to be market participants in a neighboring jurisdiction, under the conditions that both jurisdictions extend such rights.

Regulation
The oversight of a market by an administrative agency or regulator, including any intervention in the markets to set rates and other terms and conditions under which the regulated service must be provided. Traditional electric regulation attempts to put a monopoly under restraints to achieve prices (rates), output and investment levels comparable to those that would occur under a competitive market.

Regulator
An entity that, through power of law or some other legitimate means, has the authority to impose regulation.

Reliability
Reliability is considered to be one of the most important characteristics of any electricity supply and refers to the degree of performance of the elements of the bulk electric system that results in electricity being delivered to customers within accepted standards and in the amount desired. Reliability may be measured by the frequency, duration, and magnitude of adverse effects on the electric supply.

Renewable fuels
Renewable energy sources are those that produce electricity or thermal energy without depleting resources. Renewable energy includes solar, wind, water, earth and biomass power, and energy from waste.

Renewable Portfolio Standard
A requirement that a certain amount of electricity sold in a competitive market include some amount produced from approved renewable sources.

Retail Market or Retail Access
A market in which electricity and other energy services are sold directly to consumers by competing suppliers. Also known as Direct Access.

Retailer
An entity that purchases electricity for the purpose of selling electricity to a consumer or acting as agent or broker for a consumer or another retailer with respect to the sale of electricity.

RFP (Request for Proposals)
A process for obtaining competing proposals from providers of a service or product.

Robustness
Robustness refers to the ability of Market Rules and protocols to function well under a wide range of market circumstances.

RTO (Regional Transmission Organization)
An entity independent of market participants that is responsible for the operation of the transmission system and administration of the transmission tariff. FERC's requirements for RTOs were first set forward in Order 2000.

SBC (Systems Benefits Charge)
A charge placed on electricity end users to create a fund used for various social purposes, such as energy efficiency programs or equalization of rates for rural or remote customers.

Self-Regulation
A regulatory approach whereby industry participants develop and administer the rules governing their operations, subject to appeal to a government regulator.

Single Buyer Market
A market with a monopoly buyer facing competitive suppliers. In electricity restructuring, it can be a first step towards competition from a vertically integrated monopoly utility structure. See Monopsony.

Spot Market
A market in which goods are traded for immediate or near-immediate delivery. In many electricity market designs, the market operator would operate and administer settlements for a spot market, in which suppliers could submit bids to sell and purchasers could submit offers to buy energy through a coordinated auction, with settlements based on market-clearing prices. Market participants are free to use the spot market to sell/purchase energy at market-clearing prices, as needed.

Spot Market Prices
The market-clearing prices determined in a spot market and used as the basis for settlements for all purchases and sales in that spot market.

Stand-by Charge
A charge imposed on a transmission customers to have access to the grid and the generation and ancillary services provided by the grid. Traditionally, stand-by charges have been imposed on customers who relied on the grid only intermittently, on a "stand-by" basis.

Stranded Costs/Investment
Costs that cannot be recovered from market prices. With respect to electricity competition, stranded investments are those assets owned by a utility that would become uneconomic in a competitive market.

Strike Price
With reference to bilateral contracts, the price at which parties to the contract have agreed to trade and to settle their transactions.

Substation
Facility equipment that switches, changes, or regulates electric voltage.

System Operator
The entity with the responsibility to monitor and control an electric system in real time. (The term can also refer to the individual at an electric system control centre who is monitoring and controlling the electric system in real-time).

System Losses
Percentage of kWh's injected in to the system that was not ultimately billed to the customer. Losses can be due to line or transformation losses, errors in billing or billing estimates or theft of power.

Tariff
The terms and conditions under which a service or product will be provided, including the rates or charges that users of service or product must pay. Tariffs are usually proposed by the service or commodity provider, and are subject to regulatory approval. Typically, the rates and terms for obtaining transmission service are set forth in a tariff.

Time-of-Use Meter
A meter capable of measuring and recording the amount of electricity used during defined set periods for which specific tariffs for electricity consumption are applicable, such as daytime peak, nighttime off-peak, winter, summer.

Trader
Buys or sells on own account, but generally does not take delivery.

Trading Period
The time period in the marketplace for which physical trades are defined. The trading period for most short-run electricity markets is an hour or half-hour. All bids, offers, nominations must be defined in terms of the trading period (e.g. half-hour, hour etc.). Each trading period has its own schedule and dispatch, as well as its own market-clearing price and settlement.

Transformer
Apparatus which increases or decreases the voltage (the "pressure," as opposed to the current strength) at which electricity flows.

Transmission
The movement or transfer of electric energy over an interconnected group of lines and associated equipment between points of supply and points at which it is transformed for delivery to consumers, or is delivered to other electric systems. Transmission is considered to end when the energy is transformed for distribution to the consumer.

Transmission Services
The acceptance, transmission and delivery of power within a Control Area. May include specific ancillary services.

Transmission Tariffs
The authorized charges levied for provision and use of transmission services.

Transparency
Transparency refers to the degree with which the market rules and protocols are simple enough to fulfill the goals of market efficiency and market function. In addition, under this principle actions by the market operator and system operator should be capable of audit and verification and market information should be available to all market participants on a timely basis.

UARB
The Nova Scotia Utility and Review Board.

Unbundling
The breaking down of a bundled service into its component parts so that a customer can choose to purchase different components of the service from different parties. When LDCs offered only bundled services, their customers could purchase electricity only from the LDC. In an unbundled environment, the customer can choose to purchase its electricity supply from any supplier it wants and the LDC provides delivery to the customer's meter. Additional unbundling may allow other parties to provide other components of service, such as billing, meter reading, and credit and collection services.

Vesting Contracts
Contracts that are entered into prior to the start of a new market. Typically vesting contracts are used to assure that the benefits (or costs) of key resources owned by the incumbent utility are captured by (or imposed upon) consumers for some defined period after competition begins.

Wheeling
The use of an interconnected transmission system to implement electricity transactions that transmit power into (wheeling in), within, out of (wheeling out) or through (wheeling through) that system.

Wholesale Customer
A wholesale customer is a market participant who purchases electricity for sale to retail customers.

Wholesale Market
This refers to the market in which electricity and other energy services are sold to wholesalers/retailers/distributors (who in turn sell to retail or end-use customers). A wholesaler/retailer/distributor of power would have the option to buy its power from a variety of generators or suppliers, and the generators or suppliers would be able to compete to sell their power to a variety of wholesalers/ retailers/distributors.

Wholesale Pool Market
Term used to refer to a security-constrained least-cost generation dispatch coordinated by the system operator, based on bids to sell and offers to purchase submitted by market participants, and the associated settlement system.

Zonal Pricing
A form of LMP in which the price for electricity is determined for specific regions or zones (as opposed to points or nodes) of a transmission system.